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The Use of Bottom-Up, Sensory-Based Approaches for Adolescents with Complex Trauma

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Focused Question

To what extent do the use of bottom-up, sensory-based approaches improve self-regulation in adolescents aged 5-18 who have experienced complex trauma?

Clinical Scenario

Complex trauma is defined as the long-term effects of repeated exposure to severe traumatic events (Fraser, McKenzie & Versnel, 2019). Children who have experienced complex trauma have a decreased ability to regulate their emotions (Warner, Spinazzola, Westcott, Gunn & Hodgdon, 2014). Not being able to process and regulate one's emotions leads to a lack of occupational participation (Fraser et al., 2019; Warner et al., 2014). These impacts can be seen in adolescents' daily occupations such as play, education, leisure activities, and social interactions both at home and in the community (Fraser et al., 2019; Warner et al., 2014). This type of repeated stress caused by complex trauma also impacts physiological development of the sensory cortex and limbic system (Finn, Warner, Price & Spinazzola, 2018; Rinne-Albers, van der Wee, Lamers-Winkelman & Vermeiren, 2013). The limbic system is in control of emotions while the sensory systems impact functions. Thus, trauma impacts physiological development which inhibits adolescents' abilities to self-regulate and to integrate sensory input (Rinne-Albers et al., 2013). Sensory integration is the ability to appropriately process and respond to input from one 's environment based on internal cues, and self-regulation is the ability to appropriately respond to sensory cues (Fraser et al., 2017).

Adolescents' daily occupations impacted by complex trauma highlight where occupational therapists can facilitate positive changes. During this process, the culture and values of clients should be taken into account to align with the philosophy of occupational therapy. For

example, if a client values appreciation from others or their culture encompasses togetherness, this could be incorporated into treatment sessions which would enhance participation. Occupational therapists have strong knowledge of typical child and adolescent development and how development is impacted by trauma (Fraser et al., 2019). This impact on development, in turn, affects the abilities to integrate sensory information (Warner et al., 2014). An inability to integrate sensory information impacts self-regulation and is essential for adolescents to be able to participate in occupations in a functional way (Ogden, Pain, & Fisher, 2006). This creates challenges later in an adolescent's life to engage in meaningful occupations such as education and socialization. Occupational therapists utilize bottom-up, sensory-based approaches to enhance individuals' occupational engagement in many areas concerning adolescents who have experienced trauma (Fraser et al., 2019).

Through the advancement of knowledge in neuroscience about how the brain processes information, it has become evident that a bottom-up approach in addressing adolescents with complex trauma should be a priority (Fraser et al., 2019). Sensory-based treatment is a bottom-up approach that targets sensory integration skills. These skills are impacted as adolescents' brains are continuing to develop during the experiences of complex trauma. Their bodies experience this trauma on a sensorimotor basis (Rinne-Albers et al., 2013). Bottom-up approaches address arousal states occurring in posterior parts of the brain that have been affected by traumatic experiences and lay the foundation for addressing higher cortical functions that are required for top-down, cognitive-behavioral interventions (Fraser et al., 2019). Due to how the brain is affected by complex trauma, and the fact that adolescents' brains are still developing, bottom-up approaches are necessary for top-down approaches to be effective (Ogden et al.,

2006). The purpose of this paper is to assist occupational therapists in making clinical decisions involving the use of bottom-up, sensory-based approaches to address the self-regulation problems occurring in adolescents who have experienced complex trauma.

Synthesized Summary of Key Findings

For this critically appraised topic, we reviewed five articles including one randomized-controlled trial, one quasi-experimental study, two case studies, and one descriptive article. Though there was evidence to support the use of top-down, cognitive approaches for the treatment of complex trauma, these types of interventions alone may not be appropriate for all adolescents (Finn et al., 2018; Fraser et al., 2019; Raider, Steel, Delillo-Storey, Jacobs & Kuban, 2008; Warner et al., 2014). Authors agreed that complex trauma negatively impacted the cognitive skills necessary for Cognitive-Behavioral Therapy (CBT) and was experienced at a sensory level (Finn et al., 2018; Fraser et al., 2019; Raider et al., 2008; Warner et al., 2014). Occupational therapists working with adolescents with complex trauma interviewed by Fraser et al. (2019) identified self-regulation difficulties as a primary barrier to their clients' occupational engagement. Bottom-up approaches to treatment are the most appropriate for adolescents with complex trauma who have not seen success with traditional therapy (Fraser et al., 2019). Raider et al. (2008) went further to describe how adolescents with complex trauma often experienced traumatic memories at a sensory level and develop dysfunctional coping mechanisms for these experiences, causing the self-regulation difficulties often observed during treatment. Self-regulation difficulties can present as aggression, overreaction to stimuli, anxiety, or negative behaviors (Raider et al., 2008).

The authors of the literature reviewed acknowledged that complex trauma negatively impacted self-regulation skills, but that typical talk-therapy and cognitive-behavioral interventions did not address these difficulties (Finn et al., 2018; Warner et al., 2014). Bottom-up, sensory-based treatment approaches are valuable for adolescents who are experiencing dysregulation due to trauma (Raider et al., 2008). Finn et al. (2018), Fraser et al. (2019), and Warner et al. (2014) agreed that adolescents must develop a sense of control and safety in their bodies to build self-regulation skills before they can continue with treatments involving cognitive or verbal processing. Raider et al. (2008) and Spinazzola, Rhodes, Emerson, Earle & Monroe (2011) promoted bottom-up, sensory-based, and cognitive-behavioral approaches in conjunction as the best course of treatments for adolescents with complex trauma.

Difficulties with self-regulation can cause behavioral, functional, and health complaints. There is a growing evidence base supporting the use of sensory-based approaches for the treatment of complex trauma which addresses somatic dysregulation and leads to improved self-regulation (Finn et al., 2018; Fraser et al., 2019; Raider et al., 2008; Spinazzola et al., 2011; Warner et al., 2014). Researchers who studied sensory-based approaches in recent years agreed that sensory-based approaches incorporated movement, removed the sole focus of treatment from verbal expression, and facilitated self-awareness to encourage self-regulation (Finn et al., 2018; Spinazzola et al., 2011). The evidence base consistently defined self-regulation as the ability to process internal cues and respond appropriately with a sense of control and safety in one's own body (Finn et al., 2018; Fraser et al., 2019; Raider et al., 2008; Spinazzola et al., 2011; Warner et al., 2014).

Throughout the literature, a primary goal of bottom-up, sensory-based approaches used in interventions was to improve self-regulation in adolescents with complex trauma (Finn et al., 2018; Fraser et al., 2019; Raider et al., 2008; Spinazzola et al., 2011; Warner et al., 2014). Finn et al. (2018) and Warner et al. (2014) both examined the effectiveness of the SMART model for improving self-regulation in this population. The focus of this model is on "embodied play" (p. 280) or using the whole body while playing with the intention of achieving regulation (Finn et al., 2018). The quasi-experimental study conducted by Warner et al. (2014) provided preliminary support for the potential effectiveness of the SMART model. A more recent case study by Finn et al. (2018) indicated that the use of the SMART model showed improvement of behavioral and emotional regulation. The SMART model is an example of how a bottom-up approach using sensory-based methods can be incorporated into interventions (Finn et al., 2018; Warner et al., 2014).

Self-regulation is improved through the use of bottom-up interventions and should be developed before addressing interventions using verbal processing such as in cognitive behavioral therapy (Finn et al., 2018; Fraser et al., 2019; Warner et al., 2014). Finn et al. (2018) and Fraser et al. (2019) both used a sensory modulation framework for improving self-regulation in adolescents. Fraser et al. (2019) highlighted the importance of occupational therapists working with adolescents who have experienced trauma. The knowledge that occupational therapists have of sensorimotor systems and development is valuable in treating complex trauma and should be further included in the care teams. Occupational therapists have an opportunity to work collaboratively with other professionals, such as psychologists and social workers, who also frequently interact with adolescents with complex trauma.

While the above articles focused on addressing sensory issues before addressing more complex cognitive issues, Raider et al. (2008) suggested that the two approaches could be used together. Through a randomized control trial, they used the intervention SITCAP-ART that has an emphasis on structured group therapy with sensory and cognitive/behavioral components for adolescents with trauma. This intervention targeted emotional regulation allowing clearer thinking. Raider et al. (2008) used trauma-focused drawing as their sensory-based intervention, aimed to trigger clients' sensory-based memories and helped them better regulate emotions. Just as Raider et al. (2008) used an intervention that targeted the sensory systems to improve self-regulation, so did Spinazzola et al. (2011) through a yoga-based intervention. Yoga uses breathing, meditation, and different types of postures as the primary vehicle to induce self-regulation (Spinazzola et al., 2011). A common theme throughout the articles had been to provide a bottom-up, sensory-based approach to give the client a sense of control, mastery, or comfort in their own body. Spinazzola et al. (2011) explained that the mindfulness of yoga helped adolescents to notice the sensations of their bodies and begin to self-regulate.

The highest level of evidence found in the literature was an RCT study conducted by Raider et al. (2008). They had high internal reliability of measures and showed significant results with the sensory regulation approach using the intervention SITCAP-ART. This study showed a statistically significant reduction in mental health symptoms. Also, youth who participated in the study stayed out of the criminal system after the study ended. While the study had a controlled design and the participants were randomly assigned to experimental groups, the small sample size was a limitation (Raider et al., 2008). The next highest level of evidence used was a quasi-experimental study conducted by Warner et al. (2014). This article had a strong theoretical

foundation and reliable test measures. There was also high internal validity due to reliable and valid data measures and analysis. This study showed statistically significant results in favor of the SMART model for reducing somatic complaints and feelings of anxiety and depression in adolescents with complex trauma. The limitations of this study included the small sample size and lack of randomization (Warner et al., 2014). Raider et al. (2008) and Warner et al. (2014) both indicated the need for future research to address the effectiveness of sensory-based approaches with larger sample sizes and randomization.

Fraser et al. (2019) conducted a descriptive study that had consistency and credibility in their data collection procedure and data analysis. All of the occupational therapists interviewed had experience treating children and adolescents with complex trauma and could identify the children's concerns throughout the process of treatment accurately. Interview transcriptions were thoroughly reviewed for accuracy and an audit trail was used to track the data analysis process. Limitations included the use of non-randomized purposive sampling that led to snowball sampling. It should also be noted that interviews took place from the therapists' perspectives, rather than the clients' (Fraser et al., 2019). The last two studies appraised were case studies. Finn et al. (2018) used a single case study providing preliminary evidence supporting the use of the SMART model for the treatment of complex trauma. The main limitation of a single case study is the limited generalizability from an empirical standpoint (Finn et al., 2018). Spinazzola et al. (2011) also used a case study to present the use of trauma-informed yoga for intervention with adolescents who had experienced complex trauma. The study showed rigor in that the yoga teachers were specially trained in yoga as well as in trauma-informed care. They also provided a thorough rationalization for the use of yoga in this population. The components of yoga

intervention, such as breathing and meditation, have been shown to improve self-regulation (Spinazzola et al., 2011). The authors explained the need for further research for the effectiveness of yoga-based interventions that address self-regulation. In addition, a potential bias was the lack of stated limitations present in the article (Spinazzola et al., 2011). Overall, small sample size was a common limitation in the literature, affecting the validity of the studies reviewed. Authors agreed that there was sufficient qualitative evidence supporting the use of sensory-based approaches for the treatment of adolescents with complex trauma. The authors proposed further quantitative research with larger sample sizes (Finn et al., 2018; Fraser et al., 2019; Raider et al., 2008; Spinazzola et al., 2011; Warner et al., 2014).

Clinical Practice Applicability

Complex trauma in childhood and adolescence negatively impacts development, sensory integration, and self-regulation skills (Fraser et al., 2019; Warner et al., 2014). In the past, cognitive-behavioral or talk-therapy interventions have been the typical treatments for complex trauma (Raider et al., 2008). However, complex trauma's negative impacts on development may mean that adolescents do not possess the self-regulation and verbal skills necessary to be successful with these approaches (Finn et al., 2018). In these situations, sensory-based approaches have been shown to improve self-regulation skills, and are beneficial prior to or in combination with cognitive-behavioral treatments (Finn et al., 2018; Fraser et al., 2019; Raider et al., 2008; Spinazzola et al., 2011; Warner et al., 2014). It is clear that trauma negatively impacts adolescents' occupational engagement and that occupational therapists have a role in remediation. Knowledge of sensory integration and development makes occupational therapists valuable in the use of sensory-based approaches for complex trauma in the population of

adolescents (Fraser et al., 2019). Evaluation, interventions, and implementation of programming for this population should include occupational therapists, psychologists, social workers, and caregivers (Fraser et al., 2019; Raider et al., 2008). The practice context should be taken into consideration as most of the evidence provided was based in residential treatment settings. This was a potential bias, as these interventions may not be accessible to populations outside of the residential treatment context. Children and adolescents who have experienced complex trauma may have less access to healthcare or social support at home. These children may or may not be represented by the literature, creating additional bias in the evidence. Occupational therapists who wish to incorporate bottom-up, sensory-based approaches for adolescents with complex trauma should develop a strong background in trauma-informed care and seek out continuing education opportunities that address sensory integration or self-regulation. Therapists should also foster interprofessional relationships with others who treat adolescents with trauma. Interventions that are present in the research literature and evidence-based approaches should continue to be used. The culture embedded within a client's context should also be considered, as this may affect how adolescents engage within a program and how they view themselves and the trauma they have experienced. There is ample evidence within the literature indicating that bottom-up, sensory-based approaches are effective for improving self-regulation in adolescents aged 5-18 who have experienced complex trauma.

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